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REMARKS

By this amendment, claims 47-85 are canceled and new claims 86-124 are added to place this application in condition for allowance.

In review, two independent claims are before the Examiner, nozzle claim 86 and method claim 100. Claim 86 represents the combination of claims 47 and 48 with claim 100 deriving from a combination of claims 65 and 80. The chart below provides the Examiner with a map showing correlation between new claims 87-99 and 101-117 and old claims 47-85. New claims 118-123 parallel claims 93, 95, 102, 110, 111, and 113 but with different dependencies. New claims 124 and 125 are added to cover the combination of the resistor layer with the insulating dielectric layer, the heating layer, the cover layer, and the interlayer. Claim 86 also recites that the pretension is permanent, and support for this may be found on page 4, line 6 of the specification.

new	old	new	old
87	51	101	81
88	50	102	82
89	52	103	83
90	53	104	84
91	54	105	85
92	49	106	66
93	55	107	68
94	58	108	69
95	60	109	70
96	61	110	71
97	62	111	72

98	63		112	73
99	64		113	75
			114	74
			115	77
			116	78
			117	79

Applicant submits that the relied upon prior art does not establish a *prima facie* case of obviousness against either of claims 86 or claim 100. The salient feature common to each of these claims is the pretension created in the ceramic layer when the ceramic or vitreous layer is bonded to the flow tube wall. This tension tolerant bonding is a significant advancement in the art since the nozzle is able to withstand the delamination forces created during the injection operation, see pages 11 and 12 of the specification. The prior art does not whatsoever even acknowledge the problem with these delamination forces let alone suggest a solution. Only the inventors have discovered that the problem can be solved by prestressing a basic dielectric layer in such a manner that even at the highest operating temperatures, the pretension would still than more compensate for any thermal expansion beneath the dielectric layer.

In the rejection, the Examiner cites United States Patent No. 5,973,296 to Juliano et al. (Juliano) to reject claim 47 under 35 U.S.C. § 102(b). The Examiner alleges that Juliano teaches the claimed heating elements in film form.

The Examiner rejects claim 48 based on 35 U.S.C. § 103(a) based on Juliano when modified by United States Patent No. 6,222,166 to Lin et al. (Lin). In this rejection, the Examiner contends that Lin discloses a laminate of a metal and a dielectric, which have the claimed difference in the coefficient of thermal expansion.

The Examiner further concludes that it would be obvious to modify Juliano with the laminate of Lin, and such a combination obviates claim 48.

The rejection of claim 47 is moot as a result of its amendment. The rejection of claim 48 based on the combination of Juliano and Lin fails since the Examiner has not established a *prima facie* case of obviousness. First, Juliano is not related to the invention in that it does not teach or suggest whatsoever the feature of the invention wherein the dielectric layer is coated onto the nozzle tube wall and then fired so as to create the pretension in the ceramic adjacent the flow tube of a nozzle. Instead, Juliano is an improvement over hot runner nozzles that use firing techniques. This is clearly evidenced by Juliano's discussion of the problems with firing of dielectrics for hot runner nozzles as detailed in col. 3, lines 22-42. As a solution to this problem, Juliano prints the dielectric layer 44 onto the cylindrical exterior surface 46, see col. 6, lines 15-20, and lines 50-55. Notably, Juliano does not associate firing the dielectric as part of the printing process. Thus, it is clear that Juliano is not related to the invention at all.

Lin is similar to Juliano in that it is also directed to a thick film heater but this is where the similarity ends. Whereas Juliano employs a printing technique as his advancement over the art, Lin proposes a method that eliminates the firing of the prior art techniques, see col. 3, line 37. The aim of Lin is to be able to use an aluminum substrate that has a high CTE as part of a heating device. Lin also recognizes the shortcomings in prior art techniques when using firing techniques and glass or glass based dielectrics, see col. 4, line 63 to col. 5, line 15. Instead of firing, Lin uses a thermal spraying technique and a ceramic oxide as the dielectric, see col. 4, lines 47-50.

Lin also does not recognize the creation or importance of the pretensioned dielectric layer; there is no mention whatsoever of the creation such a dielectric layer. This is also evidenced by the fact that Lin discloses a range of the CTE for the ceramic oxides whereby the ceramic oxide could have a CTE greater than the aluminum substrate. More specifically, the upper end of the ceramic oxide's CTE range is $19 \times 10^{-6}/\text{C}$ whereas the aluminum substrate has a CTE of $16 \times 10^{-6}/\text{C}$. Moreover, Lin does not say that the CTE of the ceramic oxide must be less than that of the substrate.

The failure of Lin to even recognize the instant invention is also important in addressing the Examiner's allegation that if Juliano were modified with Lin, the pretensioned dielectric would be inherent. This cannot be the case since Lin also teaches that the CTE of the ceramic oxide could be greater than the aluminum substrate and that pretensioning of the dielectric would not occur in every instance. As the Examiner knows, to formulate a rejection based on inherency, the inherent property must always occur; it cannot be a possibility or probability. In the instant case, practicing the teachings of Lin does not always results in the claimed pretensioned dielectric layer, and at most, Lin must be further modified. That is, the Examiner would have to allege that it would be obvious to control the CTE of the ceramic oxide to always be greater than that of the metal so that the claimed pretensioned arrangement is achieved. However, there is absolutely no reason to modify Lin and arrive at such a result other than the hindsight application of the prior art in light of Applicant's disclosure. Since such a position is impermissible under current patent law standards, there is no proper basis to formulate a rejection under 35 U.S.C. § 103(a) based on Juliano and Lin.

Again, Applicant deliberately chooses the mismatch of the CTE between the dielectric and its adjacent layer in order to achieve on the dielectric layer a pretension that exceeds the maximum thermal expansion occurring during operating conditions.

This concept is not found anywhere within the four corners of either Juliano or Lin.

The rejection is also faulty because there is no reason given in the rejection to combine Juliano and Lin. This alone taints the rejection and requires its withdrawal. At most, the Examiner has made observations regarding the two references, but has supplied no reasoning as to why they should be combined.

Even if a reason was given, the rejection is still improper as it lacks the proper motivation to combine the references. In the rejection, the Examiner admits that Juliano does not teach the relationship between the dielectric and the metal tube. The Examiner then cites Lin to allege that such an arrangement is found in Lin and apparently takes the position that it would be obvious to use such an arrangement in Juliano. However, the mere fact that Juliano and Lin coexist does not by itself support the rejection of record. As stated above, Juliano is directed to a novel technique using printed dielectric and heater elements as a replacement for conventional methods that involve firing. Lin also teaches an alternative to firing techniques using a special dielectric material and a special application process, flame spraying. Why substitute the method of Lin for the method of Juliano? There is no reason to do so. Further, it is improper to merely pick portions of Lin and apply them to Juliano. This is just the use of hindsight. Again, there is no reason why one would combine the two references, and the rejection of claims 86 and 100 should be withdrawn.

Assuming *arguendo*, that one of skill in the art would be motivated to use the

flame spraying of a ceramic oxide on an aluminum substrate as taught by Lin in Juliano, the modified Juliano technique does not teach the invention. Lin does not fire a dielectric on a tube wall to create a pretensioned dielectric that would withstand the repeated delaminating forces imposed on the nozzle, and therefore does not teach the electric heating device of claim 86 or method of claim 100. Because of this failing, even if Lin were combined with Juliano, the invention is not taught.

This position is particularly true for claim 100. Even if the Examiner maintains his position that modifying Juliano with the features of Lin produces the claimed nozzle, these two references clearly do not teach the method of claim 100, and this claim remains patentably distinct from this prior art.

The third reference to Slegt does not make up for the deficiencies in either of Juliano or Lin, and even if combined with these two references, a *prima facie* case of obviousness is not established.

In summary, it is Applicant's contention that the Examiner has failed to meet his burden of establishing obviousness against claims 86 and 100. Their respective dependent claims are in condition for allowance by reason of their dependency.

Accordingly, the Examiner is respectfully requested to examine this application and pass claims 86-125 onto issuance.

The above constitutes a complete response to all issues raised in the Office Action of July 11, 2003.

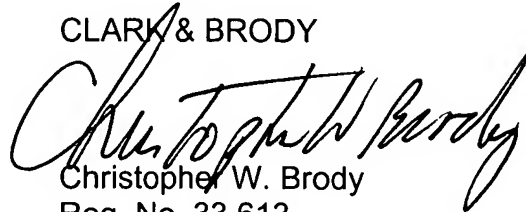
Again, reconsideration and allowance of this application is respectfully solicited.

A petition for a one month extension of time is requested. A check in the amount of \$55.00 (small entity) is enclosed.

Please charge any fee deficiency or credit any overpayment to Deposit Account
No. 50-1088.

Respectfully submitted,

CLARK & BRODY



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